MALARIA ?

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JAPANESE MALARIA REGULATIONS

AS TAKEN FROM CAPTURED DOCUMENTS. (TRANSLATED)

File of Regulations for the Temporary Prevention of Tropical Fevers, belonging to 41 Div Medical Unit Comdr MORIYAMA, Matsujiro, dated 25 Feb '43. FINSCHHAFEN, date unknown.

Chapter I General Rules:

Article 1. These regulations are based on the regulations of the 41st Div Medical Unit for the temporary prevention of ague and the regulations of the 18th Army for the prevention of epidemics, and they prescribe matters pertaining to the prevention of ague, which are to be enforced for a short period after the landing at WEWAK.

Article 2. These regulations prescribe matters principally concerned with precautionary action against malaria and acute contagious intestinal diseases. For general matters not especially prescribed, refer to the 41st Div Medical Unit regulations for precautionary measures against contagious diseases.

Article 3. Tropical war becomes a medical war. It is necessary to remember that the prevention of epidemics is the same as a combat action.

Article 4. Each unit comdr will have an important responsibility concerning the strict enforcement of these regulations, which are the outcome of the recent tropical war.

Article 5. The chief medical officer will assist the unit comdr in regard to the prevention of epidemics, and will strictly supervise these regulations.

Article 6. For the purpose of making a round of sanitation inspection, an officer of the day will be appointed from the medical dept.

Chapter II Malaria:

Article 7. It appears that an epidemic of malaria depletes the fighting strength more than acute, contagious diseases. Each unit comdr will particularly endeavour to obtain satisfactory results by being thorough in the instruction, and by ensuring military discipline, in prevention of ague.

Article 8. From the day of the landing at WEWAK, the internal precautionary measures for malaria will begin according to the following method:

1. Take a tablet of sulphur chloride with one GO (T.N. about 1/3 of a pint) of chilled boiled water after each evening meal. Add a tablet of "HINORAMIN" every tenth day. Continue to repeat.

2. Even those receiving aid for other sickness and injuries will without exception, continue to take these doses.

Article 9. The adminstering of malaria preventatives will be carried out in the presence of an officer designated by each unit comdr. Each section leader will make entries on the roster Form No. 1 of internal preventatives for malaria. The officer of the day will report the circumstances of the administering to the medical officer in charge.

Article 10. There will be strict enforcement of the following articles pertaining to the extermination of mosquitoes and the prevention of bites, etc.

(a) Clear away the lower branches of the trees in the vicinity of the bivouac areas; cut the grass and eliminate the breeding spots of insects.

(b) At night, create a heavy smoke with branches, weeds, and the husks of coconut trees to drive away the mosquitoes. A small but constant smoke will invariabley be sufficient.

(c) Always sleep under mosquito-netting. Before retiring destroy the mosquitoes inside the mosquito-net to prevent bites, and on leaving and entering be careful to keep the net securely fastened.

If necessary, use the individual protective mosquito gear within the netting.

(d) On guard duty, etc, use a mosquito veil and gloves and smear protective ointment on the exposed parts of the body to prevent bites. Construct a mosquito incense stick holder with available material (bamboo tube, empty can, etc) and hang from the neck at waist level with a cord. The smoke will be protection against bites.

(e) Effect the destruction and extermination of the mosquitoes with pyrethrum and its compounds.

(f) It is forbidden to be in the nude without permission from an officer.

Article 11. To prevent the breeding of mosquitoes, the following principal items will be enforced

(a) Make a good drainage in the vicinity of the bivouac area, and cover or dry any water collections. Do not neglect empty cans, bottles and articles that collect rain. When using bamboo, cut it at the joints, so as not to leave openings for the water to collect. All these precautions prevent the breeding of mosquito eggs.

(b) On coastal areas, where drainage is difficult because of the high level of the subterranean waters, establish canals to draw in the sea water, thus making the breeding of the mosquito difficult.

(c) Prevent the development of larvae by making vertical banks of pools over one metre, and check the growth of floating aquatic plants.

(d) In pools and in artifical receptacles holding water breed small fishes (paricularly tap minnows, fighting fish, killifish, etc) to eat the larvae.

(e) Sprinkle oil, oil emulsion, etc, on accumlations of water to destroy the larvae.

Article 12. When malaria is contracted, medical treatment must be given until the germ is completely eliminated.

Article 13. If necessary, a chart will be kept of everyone below the rank of an officer suffering from protozoic bites. In these cases, the medical officer in charge will present this plan and will refer to the Medical Dept comdr for necessary assistance (Form No. 2). He will report the results to the Medical Dept comdr (Form No. 3).

The following has been translated from Japanese Daily Orders.

Div Routine Meeting (Div Bulletin). 15 April 1943.

II. Precautionary items from Div Medical Officer.

1. The percentage of malaria cases in NEW BRITAIN Island is 30% of the total strength. In LAE, it is 28%. In 20 Div there were only 35 malaria patients during March. All forces will take strict precautions against malaria. No one is to go about unclothed in the evening. Prevent contracting malaria from stings on the leg. Be especially careful as the leg nerves are not quite as sensitive and there is a tendency not to know when one has been stung by a mosquito.

2. Strictly obey rules for taking malaria preventative medicine.

3. Put in requisitions for preventative and remedial medicines before running out completely.

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Medical Bulletin (Routine Meeting). 5 May 1943.
Conclusions after enforcing Malaria prevention regulations.

I. Although during May the number of patients in the LAE Air Force greatly decreased, there are still one or two forces in which the number is large. Due to the inconsistent manner in which some units are carrying on, it is necessary to take strict precautions to see that all units enforce the malaria prevention regulations.

1. Insufficient study by staff of malaria prevention regulations.

   a. The irregularity of dress noticable in squads at roll call.

   b. Measures taken against the members of the squad by the barracks leader (includes tent leaders) to prevent the outbreak of malaria are very inadequate. Special precaution is necessary because of the poor understanding which prevails. There are many who have not read or are not abiding by the prevention regulations.

2. Inadequate study on prevention of malaria, and lack of enforcement of measures by the orderly of the week.

   a. Warnings must be given as to the irregularity of the men's dress at roll call.

   b. HQ guards will carry anti-mosquito punk sticks.

   c. HQ guards will read the malaria prevention regulations before going on duty.

3. Items which HQ guards will keep in mind while on duty:

   a. The orderly room guard will wear anti-mosquito gloves.

   b. Masks will be worn when suitable anti-mosquito punk sticks are not available.

   c. When a sentry is standing guard, he may take his mosquito mask off. However immediately before going on duty, he will rub on anti-mosquito ointment.

   d. Sentries are to wear gloves while standing guard.

4. Precautions for dress of the night sentry:

a. He will strictly abide by the regulations.

b. He will wear socks while on duty.

c. It is necessary to caution the many men who are disobeying the rules and not following the malaria prevention regulations for dress after 1700 hours.

5. The use of anti-mosquito punk sticks is not sufficiently enforced. Especially endeavor to place them in the patients rooms; after doing this put up mosquito nets.

6. Diagnosis and isolation of patients is irregular. The staff will see to it that diagnosis and isolation are strictly carried out.

7. Names of those men who are disobeying the malaria prevention regulations will be announced in bulletins.

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Again this month we have more information in regards to experiments with DDT (Gesarol). From Major Dy, the 5th Air Force Malariologist we reproduce the following information:

Experiments with DDT and aircraft spraying.

a. DDT (Gesarol). Our experiments with DDT has been limited by lack of adequate supply of the chemical. Preliminary tests had shown that 5% solution of DDT in distillate will kill anopheline and culicine mosquito larvae (1st to 4th instars). Although laboratory experiments seem to indicate that DDT solution in distillate is lethal to pupae, no such confirmation was obtained in the field. The amount of the DDT solution required to kill larvae is very small; just enough solution to produce a very thin layer on approximately one-third of the surface of the water containing the larvae is adequate. Killing time ranged from 30 minutes to 24 hours. Limited experiments with adult mosquitoes and flies show that DDT is equally effective. Persistence tests with DDT are underway.

b. Aircraft spraying of insecticide. With the cooperation of the Fifth Air Force Chemical Officer, and an Attack Group stationed in Nadzab, an experiment was performed on 21 April 1944, to determine the effectiveness and practicability of aircraft oil-spraying with the view of using DDT. An A-20 aircraft was fitted with two 33-Gal CWS smoke tanks (M-10). These tanks are available in quantities at our place and are standard equipment of the CWS. The tanks were mounted under the wings of the airplane like belly-tanks; no alterations were made in the airplane except the attachment of the supports that held the tanks. Inasmuch as this was just a trail run, distillate was used to determine the coverage.

With a speed of 200 miles per hours at an altitude of 100 feet, the 2 smoke tanks (filled with distillate) effectively sprayed at least 11 acres. However, the 2 tanks were discharged simultaneously, and we are certain that if the tanks were discharged one at a time, we could have covered 16 acres easily. Four 33-Gal smoke tanks can be mounted in one A-20 aircraft. With one squadron comprising 9 airplanes we can spray approximately 330 acres per mission.

The practicability of this type of aircraft oil-spraying hinges on the use of DDT. With the above aircraft and smoke tanks it will require approximately $\frac{1}{2}$ lb DDT to the acre, based on 5% DDT solution in distillate. Although the amount of DDT required, as computed from our test, is slightly more than that recommended in the various treatises on the subject, we shall obtain the benefit of "residual" action, making it more advantageous in the long run.

From a report by Captain O. H. Graham, Sn. C. of the 5th Malaria Survey Unit, the following information is quoted:

EXPERIMENTAL USE OF DDT (GESAROL)

After obtaining some information on the properties and used of DDT (dichloro-diphenyl-trichloro-ethane) from the reports of the Allied Malaria Control Conference at Port Moresby and from Capt. Geo. W. Hicks of the 60th Malaria Control Unit it was decided to conduct some tests to determine its value under local conditions. The first test was begun on 6 April in a native garden which was crisscrossed with abandoned wheel ruts. Thirty wheel ruts were selected and marked and an estimate of the number of larvae in each was recorded. The numbers varied from 50-500 anopheline and culicine larvae and pupae. Five treatments were used and each one was replicated six times. The spray was applied with a "Flit gun" at the rate of one "squirt" per square yard. This was only estimated and was a rough approximation.

At the end of 48 hours the water holes were examined and the number of living larvae was estimated. Five of the holes were dry. The per cent kill for each treatment is shown in the following table.

TREATMENT	REPLICATE A	B	C	D	E	F
#1-10% DDT in kerosene, emulsified.	100%	100%	100%	dry	100%	100%
#2-5% DDT in distillate, emulsified.	95%	dry	dry	100%	100%	100%
#3-5% DDT in distillate.	100%	90%	75%	100%	100%	100%
#4-distillate.	0	0	0	0	0	0
#5-untreated check.	0	0	dry	0	90%	dry

It will be noticed that in the untreated water hole, replicate E, 90% of the larvae had disappeared. We can only conjecture that this many emerged or that the water was sprayed by mistake.

The emulsions seemed to be more efficent than the 5% DDT in distillate. Their spreading powers are remarkable and they would appear ideal for use in swamps and sluggish streams and other breeding places that were choked with vegetation. But they are difficult to prepare with GI soap and tend to be unstable so it was decided to forego tests with emulsions until commercial wetting agents, such as were used in the States, are available.

Many pupae survived the treatments that killed 100% of the larvae. In replicate A of treatment #2 five anopheline larvae were alive. These were studied closely and all five were full size fourth stage larvae. This would agree with the observations of Lt. W. L. Conroy, AMF, as reported at the 30th meeting of the Allied Malaria Control Conference. He found that fourth stage larvae which had ceased to feed preparatory to pupation were unaffevted by the DDT. The percentages of DDT are on the basis of volume and may be quite different from per cent by weight.

For a second experiment it was decided to use only one treatment and to attempt to duplicate a large scale control program. A saturated solution (approximately 10% by volume) of DDT in distillate was prepared and this was applied at the same rate and in the same manner as in the first experiment. Large numbers of anopheline larvae were breeding in the native garden on 12 April and the entire area was treated. Capt. John L. Brown of the 15th Malaria Control Unit cooperated and he estimated that natives with knapsack sprayers would have used about three gallons of distillate. We used one-half pint of the DDT solution.

A check was made on 13 April and only one living larva was found - a mature fourth stage anopheline. Many pupae were alive and 100 of these

were collected and brought back to the laboratory. 73 of the pupae died, 19 made an abortive attempt to emerge but died on the water, and 8 emerged successfully. More exact tests should be conducted to determine if DDT is in any way toxic to the pupae.

Heavy rains fell on 16 and 18 April. On 19 April all stages of anopheline larvae were abundant throughout the treated area. On 20 April the entire area was retreated in the same manner. At this time only one anopheline pupa was seen. A check was made on 21 April and the larvae were all dead except those in one large wheel rut. About 75 larvae and a few pupae had survived in this one rut. A moderate number of pupae were found in other treated ruts and since only one pupa was seen on 20 April quite a few had pupated after treatment.

The area was rechecked on 22 April and it was found that the larvae observed on the previous day were all dead. We conjectured that this one rut may have been sprayed too lightly and that the kill was delayed.

Because of the rapidity with which fourth stage larvae appeared the previous week we expected to find first stage larvae on 22 April (two days after treatment), but none could be found. On the 24 April large numbers of first and second stage anophelines were present. No rain had fallen since the area was treated and a trace of oil was still present on the water in many of the ruts, but it did not cover the entire surface of any of them.

On the 26 April there were a few fourth stage larvae in various wheel ruts, but they were not nearly so numerous as the first and second stages had been on the 24 April. Large numbers of first and second stage larvae were present throughout the area.

The third treatment was applied on 26 April. The same DDT solution was used but this time it was applied with a medicine dropper. One drop was placed on the water for each square yard of water surface. There was a saving in the quantity used as only about one-third pint with the "Flit gun".

The kill at the end of 48 hours was 100%. On the 2nd May there were large numbers of first and second stage larvae, a few third stage and an occasional fourth.

Our experiments have been limited in scope and the technique was not exact, but we conclude that DDT dissolved in distillate is very toxic to anopheline and culicine larvae. There may be a certain toxicity to pupae, but it does not kill pupae at the same concentration that it kills larvae. We found no evidence of persistence and it seems to us that it would be risky to plan a control program on the basis of one application every seven days.

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The following information regarding malaria situation in Hollandia was received from Major Donald S. Patterson, M.C., USASOS Malariologist.

1. Splenic indices for this area:

a. Hollandia Town	75%
b. Kg Demta	74%
c. Lake Sentani Region -	
(1) Kg Ifaar	100%
(2) Sabron	100%

2. Rainfall.

The total rain for the Hollandia area is stated as 91 inches annually. In Hollandia Town February is the wettest month with a monthly average of 12.2 inches. September with 3.4 inches per month is given as the driest month for this region.

3. Prevailing Winds.

The northwest monsoon commences in the end of November and extends through to March or April. 62% of the rain occurs during this period. Southeast winds prevail the remainder of the year.

4. Anopheline Vectors A. p. moluccensis is stated as the principal anopheline of the region. A. bancrofti is also abundant. In addition to being malaria vectors both of these varieties have been indicted as transmitters of W. bancrofti.

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Additional information on the Hollandia area is supplied from a report by Major F. J. Dy. The following is quoted:

Preliminary malaria survey of Hollandia, Dutch New Guinea. The undersigned conducted a preliminary malaria survey of Hollandia, particularly where Air Corps personnel will set up their installations and camps, on 5 May 1944. The chief purpose of this survey was to determine the malaria control program to be adopted and the relative hazard as regards malaria and dengue fever. The result of the survey is summarized as follows:

a. The malaria control problem does not vary very much from those encountered in other parts of New Guinea. Inasmuch as the vectors in this locality are chiefly A. punctulatus punctulatus and A. punctulatus var. moluccensis, our problem will consist of eliminating mosquito breeding (1) in casual water such as found in bomb craters, wheelruts, slit-trenches, etc., and (2) along the banks and back-waters of streams and lakes.

b. The soil is sandy in some areas, indicating efficient vertical drainage. Impervious clay abound along the foothills and mountain-sides where trails and jeep tracks run.

c. Native villages were seen from the air and will undoubtedly serve as our source of infection if troops are camped near them.

d. It is logical to expect that the chances of having a dengue epidemic depend, to a great extent, on the discipline of the troops. The indiscriminate dumping of tin cans around the camps which has been characteristic of troops in new areas, will precipitate increased culicine breeding. In this connection it should be remembered that the chances of contracting dengue fever are less if troops are camped in the open, inasmuch as densely shaded areas serve as excellent roosting places for mosquitoes.

e. The control of malaria in the area surveyed will not constitute an unusual problem if troops could be prevailed upon to follow existing malaria directives.

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From Major O. R. McCoy, M.C., Director Tropical Disease Control Division, Office of the Surgeon General, we have received the following information on insect repellent.

INSECT REPELLENT
(Dimethyl phthalate)
For use in the impregnation
of clothing to repel insects:

INSTRUCTIONS: About 2 to 3 ounces (half a teacupful) are sufficient to treat fatigue overalls or shirt and trousers. A larger quantity should not be used. Repeat application as needed at about 5-day intervals, using smaller quantities if the clothing becomes oily.

Use insect repellent undiluted and apply either with hand "flit-gun" or knapsack sprayer, delivering a large droplet spray. The clothing may be sprayed while being worn, provided that care is taken to protect the eyes and mouth and not to breathe in the spray material.

Clothing may be treated off the body by spraying into garments that have been turned inside out and buttoned. Insert the gun inside the reversed garment, hold shut the openings of sleeves, the neck of shirt and the bottoms of trousers while spray is applied.

IMPORTANT: Clothing should be as dry as possible when repellent is applied. Properly treated clothing will repel mosquitoes, flies, sandflies, fleas, gnats and chiggers for several days to one week. Partial protection from ticks may also be obtained from the same treatment.

The repellent in this container is suitable for use on the skin, applied in the same manner as standard issue insect repellent in 2 ounce bottles.

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The following was sent to us by Major D. S. Patterson, MC, SOS Malariologist.

E X T R A C T

TD MED 18

WAR DEPARTMENT TECHNICAL BULLETIN

MEDICAL AND SANITARY DATA
ON DUTCH NEW GUINEA.

War Department, Washington, 25, D.C. . . . . 10 March, 1944

I. Dutch New Guinea -- Rainfall in inches.

Station	No. of Yrs.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Tanah Merah	3.5	11	15	19	12	16	9	10	12	15	12	13	19	163
Sorong	23	7	7	7	10	11	13	14	10	10	7	7	7	110
Manokwari	27	11	10	13	11	8	8	6	5	5	4	7	11	99
Seroei	11	10	13	12	11	9	9	7	9	11	8	7	9	115
Sarmi	8	12	9	10	7	9	8	10	7	9	8	9	8	104
Hollandia	11	12	10	12	9	5	5	5	7	3	6	7	8	89

II. INSECTS AND ANIMALS OF IMPORTANCE TO MAN, and THEIR CONTROL. a. Vectors of disease. (1) Mosquitoes (a) Anopheles - Fifteen species of Anophelines have been reported three of which are vectors of both malaria and filariasis. The Anophelines of New Guinea are predominantly of the Australian type, whereas the mosquitoes in the western islands of the Netherlands East Indies are predominantly Asiatic. The three vectors of malaria are Anopheles punctulatus punctulatus, A. punctulatus moluccensis, and A. bancrofti. The two former are by far the most important, except near Tanah Merah, where A. bancrofti predominates.

1. A.punctulatus punctulatus, deposits its larvae in small collections of stagnant water such as accumulate in footprints, gutters, water tanks, ditches and tin cans. It breeds in muddy as well as in clear water but is not found in flowing water nor beside streams. Since it prefers artificial collections of water, it is dependent on abundant rains for its existence. This mosquito requires direct sunlight for its development. It is therefore most often found in settlements recently cleared of forests but is rare in the Upper Digoel region. It is a nocturnal flier, biting most frequently around 9 o'clock at night. Its range of flight is approximately three-quarters of a mile. As it attacks silently and produces no pain, its bite is usually unnoticed. In northern New Guinea, this species showed an infection rate of 1.5 to 5 percent, with an unusually large number of cysts in the stomach.

2. A. punctulatus monuccensis deposits its larvae in clear or turbid, stagnant or flowing water. It is found in small artificial and natural collections and also in rapidly flowing streams. It breeds in large numbers along the grassy banks of the large Digoel River. Like A. punctulatus punctulatus however, it requires exposure to direct sunlight and is never found in deep forests, although it is present in moderate numbers in open forests. At Tanah Merah, this species is said to show a natural infection rate of 13 percent. It is the most common and important domestic mosquito on the island. It invades houses during the night and feeds exclusively on human blood. It transmits both malaria and filariasis, and is the most important malaria vector in the eastern half of the island, in the Somolons and in the New Hebrides.

3. A. bancrofti breeds in shady, slowly flowing streams and in pools containing a certain type of water plant, beneath which it deposits its larvae. Owing to its prefererence for lakes and pools, it is not dependent on the rainy season. It is found in the interior of New Guinea and along the southern coast but not on the northern coast. It has been found in large numbers at Tanah Merah, at Kloofbivek on the Lorentz River, at Merauke, at Etna Bay and at Praywenbivak. At Tanah Merah, it showed an infection rate of 4.3 percent. It is a vector of filariasis as well as of malaria.

4. Malaria Control is made difficult in New Guinea by the fact that both A. punctulatus punctulatus and A. punctulatus moluccensis breed in direct sunlight. Areas cleared for settlements, therefore, become endemic foci of malaria unless they are promptly drained. The relatively long flight range of both of these important mosquitoes is another factor which makes their control a hard problem. Partly because of this long flight range, the larvae of these Anophelines are said to be extremely difficult to find.

Only fragmentary information is available concerning the control measures which have actually been taken. At Tanah Merah breeding places were oiled periodically with "blubber", a residual oil product. During epidemics suppressive quinine administration was used extensively. At Babo breeding places were drained, and residual collections of water were oiled periodically, and successfully.

(b) Aedes. - Aedes aegypti, A. albopictus, and A. scutellaris are reported. A. kochi and A. vigilax are present in Australian New Guinea and are probably found in Dutch New Guinea as well. A. aegypti and A. albopictus were not present when exploration started at the close of the last century, but are now very numerous.

1. A. aegypti carries dengue fever in New Guinea and is a potential vector of yellow fever. It is a domestic mosquito, rarely encountered more than 1,500 feet from human habitations. Its larvae are deposited in artificial collections of water such as occur in footprints, tin cans or tanks. It also breeds in leaf exile.

2. A. albopictus is a vector of dengue fever and a potential vector of yellow fever. It breeds near dwellings in small artificial collections of water.

3. A. kochi is a vector of Wuchereria bancrofti in other parts of New Guinea but is not known to carry disease in the western half of the island. It breeds in leaf axils.

4. A. scutellaris transmits filariasis in Fiji, but has not been proved a disease vector in Dutch New Guinea. It breeds in all types of artifical pools and in accumulations of water in leaf axils.

5. A. vigilex is a vector of Wuchereria bancrofti in Australian New Guinea but is not reported as a vector in Dutch New Guinea. It breeds abundantly in swamps and bites both by day and by night.

6. Many other Aedes species act as pests.

(c) Culex, - Culex fatigans, C. vishnue and C. annulirostris are reported but have not been shown to act as disease vectors. C. fatigans did not occur in New Guinea until 1929 when it was imported on the steamer which plied regularly between Ambon and Tanah Merah. In 1928, artificial infection of especially imported C. fatigans with W. bancrofti did not succeed in Tanah Merah. In 1936, more than 1,000 C. fatigans caught in the neighborhood of heavily infected Papuas did not show the presence of filariae.

1. Notwithstanding these experiences C. fatigans should still be viewed with suspicion in New Guinea owing to its proven capacity to spread filariasis elsewhere. It breeds in small artificial collections, close to human habitations. It prefers stagnant water and will breed in slightly salty water.

2. C. vishnui is reported as a vector of filariasis in India but apparently does not transmit the disease in New Guinea. It breeds in both still and flowing water, but never in brackish water. Its larvae are found in small pools and puddles, in drainage ditches, in lakes and along river banks.

3. C. annulirostris is not a proven vector of disease, under natural conditions, but has been experimentally infected with Wuchereria bancrofti. Larvae were deposited in ditches, small pools, and puddles.

(d) Others.-Mansonia annulifers and M. ochrocea are reported. The larvae and pupae of these mosquitoes attach to the roots and leaves of water-plants. Most Mansonia sp. attach to Pistia plants, principally striatoles, but some attach to Lemna and Eichornia crassipes (the water hyacinth). M. annulifera attaches to Pistia only. To find the larvae, it is necessary to shake a large number of Pistia plants in clean water, thus detaching the larvae. Mansonia sp. are the vectors of Wuchereria malayi in many areas. W. Malayi does not cause filariasis in Dutch New Guinea, althrough it is reported from other parts of the Netherlands East Indies.

III. DISEASE INFORMATION.- Diseases of Special Military Importance.- a. Malaria is the most widespread endemic disease in New Guinea. It is transmitted by three vectors, Anopheles punctulatus punctulatus, A. punctulatus moluccensis, and A. bancrofti. Since the two former required direct sunlight for their development, endemic foci are established whenever forests are cleared for new settlements, unless these areas are drained immediately after clearing. The prevalence of malaria in the coastal regions can be ascertained to some extent from surveys in which the splenic indices of natives in many villages were obtained (see table III).

TABLE III.- Splenic Indices in the Coastal Regions of New Guinea.

PLACES	YEAR	ADULTS		CHILDREN	
		No. Observed	Percentage Spleen Index	No. Observed	Percentage Spleen Index
Sabron	1931	47	77	42	100
Sarmi	1931	129	62	44	65
North Coast of Birdhead:					
Andei	1931	58	78	28	96
Manooi	1931	...	..	39	72

The entire northern coast and the southern coast of Vogelkop (Birdhead) are highly endemic areas. The vectors most frequently found are A.punctulatus punctulatus and A. punctulatus moluccensis. A. bancrofti is

not found on the northern coast. On some parts of the southern coast (between Kaimana and Atoebs) owing to the great height of the tides, there are no suitable breeding places for mosquitoes and some villages are nearly free of malaria. In the Merauke area, perhaps owing to the existence of a definite dry season between June and December, the incidence of malaria is low, although A. punctulatus moluccensis breeds there in large numbers during the rainy season. In the Memberamo River valley, malaria is highly endemic. Tanah Merah, in the southern part of the island, was formerly a highly endemic area, but, in recent years, the Dutch authorities had reduced the incidence of the disease. At Tanah Merah A. bancrofti greatly outnumbers A. punctulatus moluccensis and A. punctulatus punctulatus is rarely found. A. bancrofti is also found in large numbers at Kloofbivak on the Lorentz River, near Merauke, at Etna Bay, and at Preuwenbivan. Mountainous areas are not necessarily free from malaria, since A. punctulatus moluccensis has been reported at heights of 3,500 feet. However, there is very little malaria in the Swart Valley (3,500 feet high). An exploration party in the southwestern part of the central mountains of New Guinea remained for months completely free from malaria.

All three forms of malaria are found, but tertian is by far the most common. Table IV shows the percentage of infection, with the various types, among the natives studied at Manokwari on the northern coast, at Seroei on Jappen Island, and at Babo on the southwestern coast.

TABLE IV.-Percentages of Various Types of Malaria:

PLACE	Year	No. Examined	Tertoam	Quartan	Aestive Autumnal	Mixed
			Percent	Percent	Percent	Percent
Manokwari (clinic)	1936	1249	79	4	17	.....
Menokwari (apparently well natives)	1936	125	64	31	5	.....
Seroei	1936	216	86	4	9	.....
Babo	1937	1341	93.8	0.1	5	1.1 +

+Tropical and quartan.

Benign tertian malaria is very prevalent in the Memberamo River Valley, and in the upper Digoel Region.

As stated in paragraph (1) (a) section I, only fragmentary information is available concerning malaria control. Breeding places at Babo were drained and at Babo and Tanah Merah, pools were oiled. Quinine was probably extensively used for prophylaxis.

Blackwater fever is said to be common among Europeans and has been reported among Malay immigrants at Tanah Merah. Among 2,267 Malayans, 77 cases occurred in one year, prior to 1934, Seventy-three percent of these showed subtertian parasites on blood examinations. Six of these cases died. In 1929, there were 125 cases among 2,500 persons. In 1934, after systematic control measures had been carried out, only 4 cases were reported among 624 Malayan soldiers in this settlement. Blackwater fever did not occur in the oil camp at Babo.

b. Filariasis is endemic and widespread. It is very closely allied to malaria in New Guinea since it is transmitted by the same vectors. Anopheles bancrofti and A. punctulatus moluccensis are much more frequently infected than is A. punctulatus punctulatus. The two diseases show, therefore, approximately the same geographic distribution. They are often found in the same individuals. Culex fatigans, an important vector of Wuchereria bancrofti in Australia, the Philippines, and other Pacific islands, has not been found to be infected in Dutch New Guinea, although a careful search for infected culices was made at Tanah Merah, on the upper Digoel River, in 1936. Here, 11 percent of the adult population was found to be

infected with W. bancrofti. Among this group, W. bancrofti was found to be the chief vector, with an infection rate of 10 percent. An experimental colony of Culex fatigans which was imported into this area in 1929, could not be artificially infected with filaria.

(2) Elephantiasis is reported to be common near Hollandia, in the Waroppen area, and along the northern coast between Manokware and Sorong (with the exception of the Island of Noemfoor). The relative incidence of genital lesions and of elephantiasis of the lower extremities is not reported. The former are said to be more common in pure W. bancrofti infections.

(3) The incidence of microfilaria in the blood of adults in certain area in 1937 is shown in table V.

TABLE V.

Location	Number of Examinations	Percent Positive
Eiland Noemfoor	73	4
Koebiari	23	61
Manokwari	63	35
Wassior	36	44

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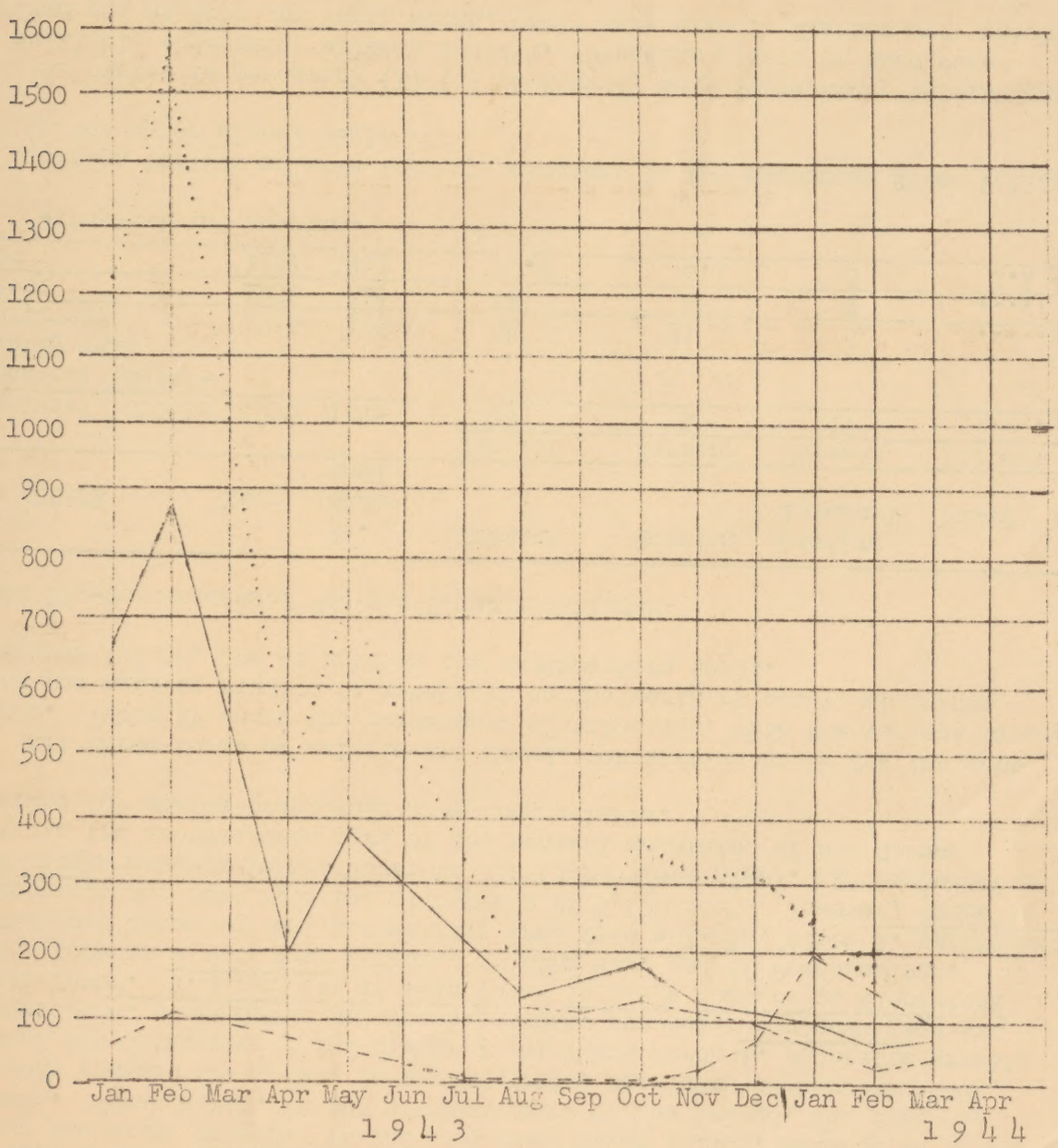

NEW GUINEA CASES
PER 1000 PER ANNUM

——— Malaria (86 ab's)
———— Malaria (case cards)
– – Dengue
···· Malaria + 75% of all FUO's.

MALARIA ATTACK RATE per/1000/annum for April 1944, for the weeks ending:

	USASOS	Sixth Army	5th Air Force Malariologist	5th Air Force Base
Milne Bay				
4 April	18	3	19	
11	5	17	78	
18	7	3	0	
25	7	13	0	
31	9	3		
Oro Bay-Dobobura				
7 April	58	42	71	38
14	58	48	150	90
21	58	44	180	197
28	38	49		62
Port Moresby				
7 April	23		20	39
14	8		34	20
21	23		14	14
28	23			52
Finschhafen				
7 April	27	32	53	
14	29	49	46	
21	29	49	46	
28	59	136	28	
Lae				
7 April	135		37	
14	55		80	
21	92		64	
28	73		63	

5th AF Malariologist Report

April	7	14	21	28
Nadzab	56	125	89	
Gusap	152	157	90	
Saidor	28	8	0	15

Goodenough - 6th Army

7 April	20
14	16
21	18
28	11

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- Flash News -

The 65th MCU and 33rd MSu arrived in this theater and are stationed at present on Cape Gloucester. The 79th MCU, fresh from the States, is now staging at Milne Bay.

On 10 May 1944 official orders assigned Major Dy, Captains Coffey and Mcmahan to 5th AF, and Captain Minter to 6th Army.

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Our thanks to Major Patterson, Major Dy, and Captain Owen Graham for their contributions to this issue of the newletter. We would appreciate receiving items on interest from anyone receiving these editions. Are there any suggestions or criticisms? What additional information do you desire? We are more than willing to continue editing this newsletter, but we must have contributions -- how about it?

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